

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-281796  
(43)Date of publication of application : 10.10.2000

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(51)Int.CI. C08J 3/03  
C08J 3/075  
A61K 7/00  
A61K 7/06  
A61K 7/32  
A61K 7/48  
C08G 77/46  
// C08L 83:12

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(30)Priority  
Priority number : 99 228863 Priority date : 12.01.1999 Priority country : US

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## (54) PREPARATION OF W1/O/W2 TYPE MULTIPLE EMULSION

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a W1/O/W2 type multiple emulsion by forming a primary W1/O emulsion using an elastomeric silicon polyether and subsequently dispersing the primary emulsion in a final continuous phase W2.

**SOLUTION:** This multiple W1/O/W2 emulsion is formed by first preparing a primary W1/O emulsion using a silicone fluid as an oil phase (O) and an elastomeric silicone polyether as an emulsifier for dispersing the water phase W1 in the oil phase (O) and subsequently dispersing the primary W1/O emulsion in the final continuous water phase W2. The multiple emulsion is useful for preparing a formulation for treating the hair, skin or underarm areas of human body. Vitamins or drugs can be incorporated into the oil phase (O) or into the either water phase W1 or W2 of the multiple emulsion.

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## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

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## CLAIMS

## [Claim(s)]

[Claim 1] It is the aqueous phase W1 first to the silicone fluid and said oil phase (O) as an oil phase (O). Primary emulsion W1 / O is prepared using the elastomer silicone polyether as an emulsifier for making it distribute. Next, it is the final continuous aqueous phase W2 about said primary emulsion W1 / O. Addition distribution is carried out and they are multiplex emulsion W1 / O/W2. W1 / O/W2 including making it form The manufacture approach of the multiplex emulsion of a mold.

[Claim 2] It is the aqueous phase W1 to an oil phase (O) first. Primary emulsion W1 / O is prepared as an emulsifier for making it distribute using an elastomer silicone polyether. Next, it is the final continuous aqueous phase W2 about said primary emulsion W1 / O. Addition distribution is carried out and they are multiplex emulsion W1 / O/W2. It includes making it form. Until \*\*Si-H content polysiloxane in which said emulsifier has a polyether radical is formed (A) — formula: — R3 SiO(R'2SiO) a b SiR (R"HSiO)3 or formula: (R'2SiO) — a b (R"HSiO) \*\*Si-H content polysiloxane expressed — and \*\*Si-H content polysiloxane (the inside of a formula, and R —) expressed by \*\*Si-H content polysiloxane or formula: HR2 SiO(R'2SiO) a(R"HSiO) b SiR2 H expressed to arbitration by formula: HR2 SiO(R'2SiO) c SiR2 H R' and R" — the alkyl group of the carbon atomic numbers 1-6 — it is — a — 0-250b — 1-250c — 0-250 — it is — (B) — formula: — CH2 =CH(CH2) f O(CH2 CH2 O) g h T (CH2 CH3CHO) or formula: — CH2 =CH-Q-O (CH2 CH2 O) g h T (CH2 CH3 CHO) (among a formula) T is hydrogen, C1 — C10 alkyl group, an aryl group, or C1 — C20 acyl group. The mono-alkenyl polyether expressed is made to react under the existence of a platinum catalyst. the bivalence connection radical on which Q contains partial saturation — it is — f — 1-6g — 4-30h — 0, or 1-100 — it is — (C) The aforementioned \*\*Si-H content polysiloxane which has a polyether radical, (D) — formula: — CH2 =CH(CH2) d CH=CH2 alpha expressed and omega-diene — Formula : alpha, omega-gene which are expressed by CH\*\*C(CH2) e C\*\*CH, And a formula: alpha expressed by CH2 =CH (CH2) e C\*\*CH, omega-en-Inn (among a formula) d — 1-20e — 0-20 — it is — until a silicone elastomer is formed, when it crosses and \*\*SiH constructs for it a bridge and adds the double bond or triple bond in unsaturated hydrocarbon (E) The (i) organic compound, the compound containing (ii) silicon atom, mixture of an organic compound (iii), (iv) The oil chosen from the mixture of the compound containing a silicon atom, and the (v) organic compound and the mixture of the compound containing a silicon atom, W1 / O/W2 which is the silicone elastomer prepared by the approach including making it react under \*\*\*\*\* The manufacture approach of the multiplex emulsion of a mold.

[Claim 3] an oil phase — formula: (CH3) — 3 SiO[(CH3) 2 SiO] k Si (CH3)3 (among a formula) k — 0-5 — it is — the volatility expressed — a line — methyl siloxane or formula: [(CH3) 2 SiO] m (among a formula) m — 3-8 — it is — the approach according to claim 1 of being the volatile annular methyl siloxane expressed and being less than 250 degrees C of boiling points, and the volatile methyl siloxane of viscosity of 0.65-5.0mm 2 / s.

[Claim 4] The approach according to claim 1 by which an oil solubility active ingredient is included into an oil phase (O).

[Claim 5] A water-soluble active ingredient is the aqueous phase W1. Or W2 Approach according

to claim 1 included in inner one side.

[Claim 6] How to process the bottom of hair including applying the multiplex emulsion prepared by the approach according to claim 2 to the bottom of hair, the skin, or \*\*, the skin, or \*\*.

[Claim 7] The multiplex emulsion prepared by the approach according to claim 1 or 2.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Field of the Invention] This invention forms primary emulsion W1 / O using an elastomer silicone polyether, and then is the final continuous phase W2 about the primary emulsion. It is made to distribute and they are W1 / O/W2. The multiplex emulsion of a mold is offered. An elastomer silicone polyether is the primary dispersed phase W1. It exists in the interface of the secondary dispersed phase O. Generally, said elastomer silicone polyether is the only emulsifier required to form such a multiplex emulsion.

#### [0002]

[Description of the Prior Art] A bigger drop than that of the 2nd liquid is distributed by the continuous phase final next including the drop of a certain liquid distributed in the drop with a bigger multiplex emulsion than that of the 2nd liquid. Generally, internal drop phases are a final continuous phase and a miscibility, or are as of the same kind as a final continuous phase. For example, in water middle oil Nakamizu mold multiplex emulsion W/O/W, an internal phase and an external phase are aquosity.

[0003] By the W/O/W system whose final continuous phase is aquosity, a primary emulsion is water-in-oil type emulsion W/O, and this primary emulsion is emulsified by the aqueous phase final next.

[0004] When the criteria about the nomenclature currently used to the W/O/W system accepted are followed so that it may be easy to understand and, the aqueous phase of a primary emulsion is W1. It is expressed and a primary emulsion is expressed as W1 / O. Primary emulsion W1 / O contains the oil phase expressed as O. The primary emulsion W1 / O/W2 The multiplex emulsion system completed after distributing the 2nd aqueous phase expressed further is W1 / O/W2. It is expressed.

#### [0005]

[Problem(s) to be Solved by the Invention] Using old common sense, in order to form a multiplex emulsion, the combination of two sorts of surfactants or a surfactant had to be used. The 2nd surfactant with which one sort of surfactants are used in order to prepare primary emulsion W1 / O, and one sort of the surfactants differ considerably generally is W1 / O/W2. It is used for the final process of the emulsification to a multiplex emulsion. This has very various phase and interface of such a multiplex emulsion system, and is because it is the system in which two sorts of stabilization effects have the conditions required of a multiplex emulsion system, i.e., the thing for which one sort of surfactants must be used to each of an oil-water interface.

[0006] By contrast, this inventions differ remarkably from such old common sense, and only one sort of surface active agents are used for them, and they are W1 / O/W2. The multiplex emulsion of a mold can be prepared.

#### [0007]

[Means for Solving the Problem] According to this invention, an underwater silicon oil Nakamizu mold (W1 / O/W2) emulsion can be formed by only shearing and diluting the silicon oil Nakamizu mold (W1 / O) emulsion prepared as an emulsifier using the elastomer silicone polyether. W1 / O/W2 obtained A multiplex emulsion is \*\*\*\*(ed) in the elastomer-property of the silicone phase

of an emulsion, and has stability higher than this conventional type of emulsion.

[0008] These emulsions can carry out the delivery of those active ingredients by including the various active ingredients containing the silicone of other classes in the silicon oil phase of primary emulsion W1 / O. For example, the silicon oil phase (O) of a primary emulsion is made to emulsify vitamin A and an oil solubility active ingredient like vitamin E, and then it is the continuous aqueous phase W2 about a primary emulsion. It is made to emulsify and they are W1 / O/W2. A multiplex emulsion can be formed.

[0009] To instead of, it is the aqueous phase W1 of primary emulsion W1 / O about a water-soluble active ingredient like vitamin C. It is made to emulsify and then is the water continuous phase W2 about a primary emulsion. It is made to emulsify and they are W1 / O/W2. A multiplex emulsion can be formed.

[0010] While such a multiplex emulsion system can protect a sensitive active ingredient like a vitamin from oxidation, it makes it possible to send a vitamin to bases, such as hair of the body, the skin, and a field under \*\*, from an aquosity matrix.

[0011]

[Embodiment of the Invention] According to this invention, an elastomer silicone polyether is used. The :process 1 prepared so that this elastomer silicone polyether may be expressed below: It is installation [0012] of a polyether.

[Formula 1]

$\equiv \text{SiH} \text{シロキサン} + \text{モノアルケニルポリエーテル} + \text{Pt触媒}$

→ ポリエーテル基を有する  $\equiv \text{SiH} \text{シロキサン}$

[0013] Process 2: Gelation [0014]

[Formula 2]

ポリエーテル基を有する  $\equiv \text{SiH} \text{シロキサン} + - \text{SiH} \text{シロキサン}$  (任意)

$+ \alpha, \omega\text{-ジエン, ジインまたはエン-イン} + \text{油} + \text{Pt触媒}$

→ ゲル/エラストマー

[0015] Process 3: A shear and swelling-arbitration [0016] [Formula 3]

ゲル/エラストマー + 油 + ビタミン/薬剤 → ベースト

[0017] Process 4: Emulsification and preparation [0018] of a primary emulsion

[Formula 4]

シリコーンゲル/エラストマー/ベースト +  $\text{H}_2\text{O}$  + ビタミン/薬剤

$+ \text{剪断} \rightarrow \text{一次エマルジョンW}_1 / \text{O}$

[0019] Process 5: Multiplex emulsion W1 / O/W2 Preparation [0020]

[Formula 5]

一次エマルジョンW<sub>1</sub> / O +  $\text{H}_2\text{O}$  + 剪断 → W<sub>1</sub> / O / W<sub>2</sub>

[0021] In the process 1, the mole ratio of a mono-alkenyl polyether to \*\*SiH in \*\*SiH siloxane should be between 0.9:1-1:12.

[0022] In a process 2, although the weight ratios of an oil to the weight of \*\*SiH siloxane which has a polyether radical, and alpha and omega-diene can be 1:1-98:1, it is between 5:1-15:1 preferably. Although the equivalent ratio of alpha and omega-diene can be 2:1-1:2 as \*\*SiH in \*\*SiH content siloxane which has a polyether radical, it is 1:1 preferably.

[0023] Although the mixture of the compound of various molds is concerned with a process 2, at least one sort of \*\*SiH content siloxanes must contain the polyether radical. For example, one compound with which it was found out that it is suitable for especially the process 2 is :Me<sub>3</sub>SiO(Me<sub>2</sub>SiO)<sub>50</sub>[MeQSiO]<sub>4</sub>5(MeHSiO)SiMe [ it is / SiMe / the mixture containing the following compound ]3, HSiMe<sub>2</sub>O(Me<sub>2</sub>SiO)<sub>10</sub>SiHMe<sub>2</sub>, and Me<sub>3</sub>SiO(Me<sub>2</sub>SiO)<sub>8</sub>4(MeHSiO)SiMe<sub>3</sub>, 1, and 5-hexadiene, and decamethyl cyclopentasiloxane. In these formulas, Me is methyl and Q is -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>O(CH<sub>2</sub>CH<sub>2</sub>O)<sub>10</sub>H.

[0024] In the process 3, the silicone paste should contain 80 - 98% of the weight of the oil. In a process 4, the weight ratios of water to a silicone paste can be 95:5-5:95.

[0025] \*\*SiH siloxane in a process 1 A1 Formula:R3 SiO(R'2SiO) a b SiR (R''HSiO)3 called a mold The compound and A2 which are expressed The compound expressed by compound or formula:HR2 SiO(R'2SiO) a b SiR(R''HSiO)2 H expressed by formula:HR2 SiO(R'2SiO) c SiR2 H called a mold, It is represented by the list with these mixture. It sets at these three ceremony and they are R and R'. And R'' is the alkyl group of the carbon atomic numbers 1-6, a is 0-250, b is 1-250, and c is 0-250. mole ratio A2 of a compound : A1 — 0:1-20:1 — it is 0:1-5:1 preferably. It sets in a desirable mode and is A1. A mold and A2 It is A1 although the compound of a mold is used for a reaction. It can react with the sufficient result only using the compound of a mold.

[0026] \*\*Si-H content polysiloxane A1 The alkyl hydrogen cyclosiloxane or the ARUKIRUHAIDOROJIEN dialkyl cyclosiloxane copolymer generally expressed by formula:(R'2SiO) a b (R''HSiO) (the inside of a formula, R', R'', and a and b are as the above-mentioned definition) may be included. Preferably, a is 0-7 and b is 3-10. Some typical compounds are 4 (OSiMeH), 3 (OSiMeH) (OSiMeC six H13), and 2 (OSiMeH) 2 (OSiMeC six H13). And (OSiMeH) (OSiMeC six H13) it is 3 (Me is -CH<sub>3</sub> among a formula.).

[0027] Unsaturated hydrocarbon is used at a process 2 and the most desirable unsaturated hydrocarbon is alpha and omega-diene which are expressed by formula:CH<sub>2</sub> =CH(CH<sub>2</sub>) d CH=CH<sub>2</sub> (the inside of a formula and d are 1-20). Some examples of representation of alpha suitable for using it in this invention and omega-diene are 1, 4-pentadiene, 1, 5-hexadiene, 1, 6-heptadiene, 1, 7-OKUTA diene, 1, 8-nonadiene, 1, 9-deca diene, 1, and 11-dodeca diene, 1, 13-tetra-deca diene and 1, and 19-eicosa diene.

[0028] However, other unsaturated hydrocarbon like alpha expressed by alpha, omega-gene, or formula:CH<sub>2</sub> =CH(CH<sub>2</sub>) e C\*\*CH (the inside of a formula and e are 0-20) expressed by formula:CH\*\*C(CH<sub>2</sub>) e C\*\*CH and omega-en-Inn can be used. Some examples of representation of alpha suitable for using it in this invention and omega-gene are 1, 3-Buta Jean, i.e., HC\*\*C-C\*\*CH, and 1, and 5-hexa gene (dipropargyl), i.e., HC\*\*C-CH<sub>2</sub> CH<sub>2</sub>-C\*\*CH. One example of alpha and omega-en-Inn suitable for using it in this invention is hexene-5-Inn -1, i.e., CH<sub>2</sub> =CHCH<sub>2</sub> CH<sub>2</sub> C\*\*CH.

[0029] The reaction in processes 1 and 2 needs a catalyst for triggering the reaction between \*\*SiH content siloxane, a mono-alkenyl polyether and alpha, and omega-diene. a suitable catalyst — they are VIII group transition metals, i.e., noble metals. Such a precious metal catalyst is indicated by U.S. Pat. No. 3,923,705. Especially the desirable catalyst is indicated by U.S. Pat. No. 3,715,334 and No. 3,814,730. A callus TETTO catalyst is a platinum divinyl tetramethyl disiloxane complex containing 1% of the weight of the platinum held at the poly dimethylsiloxane fluid or a solvent like toluene.

[0030] The specific catalyst used in the example was a callus TETTO catalyst of 20microl held as 1 % of the weight of platinum at the poly dimethylsiloxane fluid of 2.0mm<sup>2</sup> / s, and 200microl. Other desirable platinum catalysts are the resultants of a platinic chloride which is indicated by U.S. Pat. No. 3,419,593, and the organic silicon compound containing end aliphatic series partial saturation. this precious metal catalyst — per [ 0.00001 ] \*\*SiH content polysiloxane 100 weight section — the 0.5 weight sections — desirable — the 0.00001 — 0.02 weight section — it is most preferably used in the amount of the 0.00001 — 0.002 weight section.

[0031] said mono-alkenyl polyether — formula: — it is the compound expressed by compound or formula:CH<sub>2</sub> =CH-Q-O(CH<sub>2</sub> CH<sub>2</sub> O) g h T (CH<sub>2</sub> CH<sub>3</sub> CHO) expressed by CH<sub>2</sub> =CH(CH<sub>2</sub>) f O (CH<sub>2</sub>CH<sub>2</sub> O) g h T (CH<sub>2</sub> CH<sub>3</sub> CHO). C1 — C10 alkyl group whose end group of this is; they can be aryl group; or acetyl like phenyl, a propionyl, the butyryl, lauroyl one, myristoyl, and C1 — C20 acyl group like stearoyl. [ like / T expresses an end group among these formulas, and / hydrogen; methyl, ethyl, propyl, butyl, and DESHIRU ] Q is a bivalence connection radical containing a partial saturation radical like phenylene-C6 H4-. The values of f can be 1-6, g can be the value of 4-30, and h can be the value of 0, or 1-100.

[0032] To the vitamin A derivative, g comments on what the value of at least 7, i.e., the value of 7-30, should be rather taken for rather than calling it the value of 4-30.

[0033] it is used here — an oil — the vocabulary — the low molecular weight of (i) volatility — the low molecular weight of a line and an annular methyl siloxane, (ii) volatility, and a non-volatile

— a line, annular alkyl, an aryl siloxane, and (iii) the functionality of low molecular weight — the compound containing a line and a silicon atom like cyclosiloxane is included. however, the low molecular weight of volatility [ thing / most desirable ] — they are a line and an annular methyl siloxane (VMS). That is, this specific component constitutes what is expressed as an "oil" in the process 2 of an above-mentioned approach.

[0034] A VMS compound corresponds to the average unit type expressed by  $j$   $\text{SiO}(\text{CH}_3)(4-j)/2$  ( $j$  has the average of 2-3 among a formula). This compound includes the siloxane unit combined by  $**\text{Si}-\text{O}-\text{Si}**$  association. a typical unit — 1 "functionality M" unit  $(\text{CH}_3)3\text{SiO}1/2$  And 2 "functionality D" unit  $(\text{CH}_3)2\text{SiO}2/2$  it is .

[0035] 3 "functionality T" unit  $\text{CH}_3\text{SiO}3/2$  Existence brings about formation of the line into which volatility branched, or an annular methyl siloxane. Four functionality "Q" unit  $\text{SiO}4/2$  Existence brings about formation of the line into which volatility branched, or an annular methyl siloxane.

[0036] a line — VMS — formula:  $(\text{CH}_3)3\text{SiO}[(\text{CH}_3)2\text{SiO}]k\text{Si}(\text{CH}_3)3$  It is expressed. The values of  $k$  are 0-5. Annular VMS is formula:  $[(\text{CH}_3)2\text{SiO}]m$ . The values of  $m$  expressed are 3-9. Preferably, these volatile methyl siloxanes have the viscosity of the less than 250-degree C boiling point, and 0.65-5.0mm<sup>2</sup> / s.

[0037] typical volatility — a line — a methyl siloxane formula [ of 100 degrees C of boiling points, and viscosity of 0.65mm<sup>2</sup> / s ]: —  $\text{Me}_3\text{SiOSiMe}_3$  formula:  $\text{Me}_3\text{SiOMe}_2\text{SiOSiMe}_3$  of 152 degrees C of boiling points, and hexa methyl disiloxane (MM); viscosity of 1.04mm<sup>2</sup> / s expressed formula:  $\text{Me}_3\text{SiO}(\text{Me}_2\text{SiO})_2\text{SiMe}_3$  of 194 degrees C of boiling points, and octamethyl trisiloxane (MDM); viscosity of 1.53mm<sup>2</sup> / s expressed formula:  $\text{Me}_3\text{SiO}(\text{Me}_2\text{SiO})_3\text{SiMe}_3$  of 229 degrees C of boiling points, and decamethyl tetra-siloxane (MD2 M); viscosity of 2.06mm<sup>2</sup> / s expressed formula:  $\text{Me}_3\text{SiO}(\text{Me}_2\text{SiO})_4\text{SiMe}_3$  of 245 degrees C of boiling points, and dodeca methyl pentasiloxane (MD3 M); viscosity of 2.63mm<sup>2</sup> / s expressed Tetra-decamethyl hexa siloxane (MD4 M); expressed and 270 degrees C of boiling points, and formula:  $\text{Me}_3\text{SiO}(\text{Me}_2\text{SiO})_5\text{SiMe}_3$  of viscosity of 3.24mm<sup>2</sup> / s It is the hexa decamethyl hepta-siloxane (MD5M) expressed.

[0038] A typical volatile annular methyl siloxane formula:  $[(\text{Me}_2\text{SiO})_3$  which is the solid-state of 134 degrees C of boiling points formula:  $[(\text{Me}_2\text{SiO})_4$  of 176 degrees C of boiling points, and hexa methyl cyclotrisiloxane (D3); viscosity of 2.3mm<sup>2</sup> / s expressed formula:  $[(\text{Me}_2\text{SiO})_5$  of 210 degrees C of boiling points, and octamethylcyclotetrasiloxane (D4); viscosity of 3.87mm<sup>2</sup> / s expressed Decamethyl cyclopentasiloxane (D5); expressed and 245 degrees C of boiling points, the formula of viscosity of 6.62mm<sup>2</sup> / s: 6 ( $\text{Me}_2\text{SiO}$ ) It is the dodeca methyl cyclohexa siloxane (D6) expressed.

[0039] The methyl siloxane into which typical volatility branched formula [ of 192 degrees C of boiling points, and viscosity of 1.57mm<sup>2</sup> / s ]: —  $\text{C}_{10}\text{H}_{30}\text{O}_3\text{Si}_4$  formula:  $\text{C}_{12}\text{H}_{36}\text{O}_4\text{Si}_5$  of 222 degrees C of boiling points, and hepta-methyl-3-[ $(\text{trimethylsilyl})\text{oxy}$ ] trisiloxane (M3 T); viscosity of 2.86mm<sup>2</sup> / s expressed Hexa methyl-3, 3, and screw [ $(\text{trimethylsilyl})\text{oxy-one}$ ] trisiloxane (M4 Q); and formula:  $\text{C}_8\text{H}_{24}\text{O}_4\text{Si}_4$  which are expressed It is the pentamethyl [ $(\text{trimethylsilyl})\text{oxy-ones}$ ] cyclotrisiloxane (MD3) expressed.

[0040] This invention is formula:  $\text{R}_3\text{SiO}(\text{R}_2\text{SiO})_n\text{SiR}_3$ . And ( $\text{R}_2\text{SiO}$ ) using the linear and annular low-molecular-weight alkyl siloxane and aryl siloxane of the volatility expressed by  $p$ , respectively and a non-volatile also contains.  $\text{R}$  can be the alkyl group of the carbon atomic numbers 2-20, or an aryl group like phenyl. the value of  $n$  — 0-80 — it is 5-20 preferably. the value of  $p$  — 3-9 — it is 4-6 preferably. These polysiloxanes have the viscosity of about 1-100mm<sup>2</sup> / s within the limits generally.

[0041]  $n$  can also use the polysiloxane which is sufficient value for the viscosity of SHIROKISAMPORIMA to become within the limits of 100-1,000mm<sup>2</sup> / s. Typically,  $n$  can be 80-375. The examples of such a polysiloxane are poly dimethylsiloxane, the poly diethyl siloxane, the poly methylethyl siloxane, a poly methylphenyl siloxane, and a poly diphenyl siloxane.

[0042] A low-molecular-weight functionality polysiloxane can also be used and this low-molecular-weight functionality polysiloxane is expressed by formula:  $\text{R}_3\text{SiO}(\text{RQSiO})_n\text{SiR}_3$  (the inside of a formula and Q are functional groups). The example of such a functionality polysiloxane

containing the functional group expressed by Q An acrylamide functionality siloxane fluid, an acrylate functionality siloxane fluid, An amide functionality siloxane fluid, an amino functionality siloxane fluid, a carbinol functionality siloxane fluid, A carboxy functionality siloxane fluid, a chloro alkyl functionality siloxane fluid, An epoxy functionality siloxane fluid, a glycol functionality siloxane fluid, A ketal functionality siloxane fluid, a mercapto functionality siloxane fluid, They are a methyl ester functionality siloxane fluid, a perfluoro-functionality siloxane fluid, a polyisobutylene (PIB) functionality siloxane fluid, a silanol functionality siloxane, and a vinyl functionality siloxane fluid.

[0043] This invention is not limited to using only a low-molecular-weight siloxane. The oil of other classes can be used at the process 2 of said approach. That is, the mixture of an oil or an oil may be used.

[0044] therefore, here — an oil — the vocabulary — the (i) organic compound and (ii) — the compound containing a silicon atom which were enumerated previously — In order to be the mixture of an organic compound, the mixture of the compound containing (iv) silicon atom, or the mixture of the (v) organic compound and the compound containing a silicon atom and to dissolve other ingredients, (iii) In order to make it suspend, or in order to change the physical characteristic of other ingredients, it elaborates also to what is used on a scale of industrial, and \*\* of them is included.

[0045] Generally, the organic compound used as an oil is aromatic hydrocarbon, aliphatic hydrocarbon, alcohol, an aldehyde, a ketone, an amine, ester, the ether, a glycol, glycol ether, alkyl halide, or a halogenated-aromatics compound. A typical compound A methanol, ethanol, 1-propanol, a cyclohexanol, Benzyl alcohol, 2-octanol, ethylene glycol, propylene glycol, and alcohol like glycerol; A pentane, A cyclohexane, a heptane, the object for varnish manufacture, the solvent for coating manufacture (VM&P), and aliphatic hydrocarbon like a mineral spirit; Chloroform, Alkyl halide like a carbon tetrachloride, pel chloroethylene, an ethyl chloride, and a chlorobenzene; Benzene, Toluene, ethylbenzene, and aromatic hydrocarbon like a xylene; Ethyl acetate, Isopropyl acetate, ethyl acetoacetate, amyl acetate, Ester like isobutyl iso butyrate, benzyl acetate, and isopropyl palmitate; Ethyl ether, The ether like n-butyl ether, a tetrahydrofuran, and 1,4-dioxane; Ethylene glycol monomethyl ether, Glycol ether like ethylene glycol monomethyl ether acetate, the diethylene-glycol monobutyl ether, and the propylene glycol monophenyl ether; An acetone, A methyl ethyl ketone, a cyclohexanone, diacetone alcohol, methyl amyl ketone, and a ketone like diisobutyl ketone; Petroleum jelly, A petroleum hydrocarbon like mineral oil, a gasoline, naphtha, kerosine, gas oil, a fuel oil, and a crude oil; they are lubricating oil; like spindle oil and turbine oil and corn oil, soybean oil, olive oil, rapeseed oil, cotton seed oil, sardine oil, a herring oil, and fatty oil like whale oil.

[0046] Other various organic oils like an acetonitrile, nitromethane, a dimethyl HORUMI amide, propylene oxide, trioctylphosphate, a butyrolactone, a furfural, pine oil, TAPENTAIN, and m-cresol can be used.

[0047] "Oil" furthermore, in the becoming vocabulary wintergreen oil; — peppermint oil; — spearmint oil; — menthol; — vanilla bean; — cinnamon oil; — clove oil; — bay oil (bay oil); — aniseed oil; — eucalyptus-oil; — thyme-oil (thyme oil); — a SEDA leaf oil () [ cedar leaf ] oil; nutmeg oil; — SAGE oil; — cassia oil; — cacao; — glycyrrhiza; — quantity fructose corn syrup; — lemon — The oil of Orange, a lime, and citrus group vegetation like a grapefruit; An apple, Charge of volatile flavor; and cinnamyl acetate, such as fruit essence like a pear, a peach, a grape, a strawberry, a bramble, a cherry, a plum, a pineapple, and an apricot, A thinner mull aldehyde, OIGE nil formate, p-methyl anisole, An acetaldehyde, a benzaldehyde, anisaldehyde, a citral, Other useful charges of flavor containing the aldehyde and ester like neral, decanal \*\* vanillin, tolyl aldehyde, 2, and 6-dimethyl octanal and 2-ethyl butyraldehyde are included.

[0048] Furthermore, a natural product and an volatile aromatic like ethereal oil are contained in the vocabulary "oil" Becoming. Some typical natural products and ethereal oil Umber grease, a benzoin, A civet, a clove, a leaf oil (leaf oil), a jasmine, MATE (mate), MIMOSA (mimosa), musk, myrrh resin (myrrh), An orris (orris), the sandalwood oil, and a BECHIBERU oil; Amyl salicylate, An amyl cinnamaldehyde, benzyl acetate, citronellol, Fragrance chemical; and the bouquet system like a coumarin, a geraniol, isobornyl acetate, Anh Brett, and TERUPI nil acetate, It is the

etheral oil of various classic networks like an Oriental system, a sandalwood system, a woody system, a citrus system, a canoe system, a leather system, a speiss system, and a herb system. [0049] Both lipophilicity or an oil solubility vitamin, and water soluble vitamin are contained in the useful active ingredient according to this invention. Although not necessarily limited to a useful oil solubility vitamin in this invention, C2-C18 ester of vitamin A 1, retinol, and retinol, vitamin E, a tocopherol, the ester of vitamin E, and such mixture are contained. trans-retinol, 13-cis-retinol, 11-cis-retinol, 9-cis-retinol and 3, and 4-didehydro-retinol is contained in retinol. An oil solubility vitamin can be used for the constituent of this invention in 0.01 – 50% of the weight of an amount.

[0050] Retinol is an international nomenclature cosmetics component name (International Nomenclature Cosmetic Ingredient Name) (INCI) to the vitamin A specified to Washington, D.C. by The Cosmetic of the whereabouts, and Toiletry and Fragrance Association (CTFA). The INCI names about the vitamin contained in what is taken into consideration here [ other / suitable vitamin and here / suitable ] are retinyl acetate, retinyl palmitate, retinyl propionate, the alpha-tocopherol, TOKOERUSORAN, tocopheryl acetate, tocopheryl RINORIETO, the tocopheryl nicotinate, and tocopheryl succinate.

[0051] Although not necessarily limited to useful water soluble vitamin in this invention, they are vitamin C and vitamin B1. Vitamin B2 Vitamin B6 Vitamin B12, niacin, a folic acid, a biotin, and pantothenic acid are contained. The INCI names about the vitamin contained in what is taken into consideration here [ other / suitable water soluble vitamin and here / suitable ] are ASUKORU bilge palmitate, ASUKORUBIRU methyl silanol PEKUCHINETO, ascorbyl palmitate, and ASUKORUBIRUSUTEARETO. Water soluble vitamin can be used for the constituent of this invention in 0.01 – 50% of the weight of an amount like an oil solubility vitamin.

[0052] Some examples of a product available on the commercial target suitable for use by this invention Vitamin A acetate and vitamin C (both Fluka) Product;COVI-OX T-50(Henkel Corporation, La Grange, vitamin-E product of Illinois);COVI-OX of Chemie AG, Buchs, and Switzerland T-70 (Henkel Corporation) La Grange and Illinois Vitamin-E product with one [ another ] which will be accepted; it is vitamin-E acetate (product of Roche Vitamins & Fine Chemicals, Nutley, and New Jersey).

[0053] Other active ingredients like water solubility or oil solubility drugs may be contained in a multiplex emulsion constituent. The example of representation of some water-soluble suitable drugs which can be used Hydrocortisone, ketoprofen, timolol, pilocarpine, adriamycin, MITOMAISHIN C, morphine, hydromorphone, diltiazem, SEOFIRIN, The doxorubicin, a daunorubicin, heparin, penicillin G, carbenicillin, They are cephalothin, SEFOKISHICHIN, cefotaxime, 5-fluorouracil, cytarabine, the 6-azauridine, 6-thioguanine, vinblastine, vincristine, bleomycin sulfate, gold thioglucose, suramin, and mebendazole.

[0054] The examples of representation of some suitable oil solubility drugs which can be used are clonidine, scopolamine, propranolol, estradiol, a phenylpropanolamine hydrochloride, ouabain, atropine, haloperidol, isosorbide, nitroglycerin, ibuprofen, ubiquinone, indomethacin, a prostagladin, naproxen, salbutamol, guanabenz, labetalol, pheniramine, METORIHONETO, and a steroid.

[0055] an anti-bacteria agent like acne stop agent; chloro hexadiene guru KONETO like [ what is contained as drugs to the purpose of this invention ] a benzoyl peroxide, triclosan, and tretinoin — an anti-inflammatory agent:corticosteroid agent like an antimicrobial agent; salicylic acid like; miconazole nitrate — non-steroid system anti-inflammatory agent; clobetasol propionate like; diclofenac, and an anti-psoriasis agent like a retinoid — it is \*\* it is considered generally that are narcotic; antipruritic agent; anti-dermatitis agent; like; lidocaine and a barrier film.

[0056] Said approach combines \*\*SiH content siloxane, a mono-alkenyl polyether, alpha, omega-diene, an oil, and a platinum catalyst, and it is gradually performed by mixing those components at a room temperature until gel, an elastomer, a paste, or an emulsion is formed.

[0057] If it is a request, gel, an elastomer, a paste, or an emulsion can also be prepared so that other active ingredients may be included, and it can dilute further with additional congener or an additional oil of a different kind, and a final constituent can also be formed. The blend of a hexane and a tetrahydrofuran, an aromatic, or a low-molecular-weight siloxane is the example of the oil which can be used such. Since processing is promoted, high temperature can be used.

[0058] If it is a request, it can be made to react combining all the reactants (namely, \*\*SiH content siloxane, a mono-alkenyl polyether, unsaturated hydrocarbon, an oil, and a platinum catalyst) by the one pot as indicated by the United States patent application 08th / No. 866.993.

[0059] The oil of the amount of additions can be added to gel (namely, arbitration process 3), shearing force is applied to the obtained mixture, and a paste is formed. In a process 4, after adding while adding water to a paste or, primary emulsion W1 / O is again formed using shearing force. They are primary emulsion W1 / O prepared at the process 4 W1 / O/W2 Application of shearing force is continued to the process 5 made into a multiplex emulsion.

[0060] In order to carry out these processes, mixing of a batch mixer, a planet form mixer, one shaft or a multiaxial screw extruder, and the mold of dynamic or arbitration like a static mixer, a colloid mill, a homogenizer, SONORETA, or such combination and shear equipment may be used.

[0061] The process 3 of said approach is a process of arbitration as mentioned above. However, when carrying out a process 3 and including an oil, the oil should be one of the above-mentioned oils which have the capacity to dissolve an active ingredient in the case of a vitamin. As some suitable oils which have this capacity, silicon oil and a hydrocarbon system oil are mentioned. Furthermore, the oil should fulfill the conditions in connection with the melting point and solubility required for the end use to mean.

[0062] Typically, equivalent ratio of \*\*Si—H in \*\*Si—H content siloxane in which this approach 1 and 2, i.e., processes, has a polyether radical, and alpha and omega—diene is carried out by about 1:1. Although it is predicted that a useful ingredient can be prepared also by enforcing said approach, using superfluously \*\*Si—H content siloxane or alpha, and omega—diene, it will be considered that the raw material is not used not much effectively. the remainder of a constituent — a constituent — it consists of an oil of the amount of 80 — 98% of the weight of within the limits preferably 65 to 98% of the weight generally.

[0063] The most desirable approach for preparing the constituent of this invention is a room temperature, preparing an elastomer silicone polyether at a room temperature, carrying out (i) mixing, making it to dissolve an active ingredient using an additional oil, if it is (ii) need, and dissolve by adding a vitamin to an oil at a room temperature, mixing in the case of a vitamin, and mixing (iii), and includes the process which adds the oil containing a vitamin to an elastomer silicone polyether gradually.

[0064] Multiplex emulsion W1 / O/W2 which can make a fat and a water-soluble active ingredient coexist in the internal phase of an emulsion especially (i) First, internal emulsion, i.e., primary emulsion, W1 / O is prepared, (ii), next the mixed energy of an amount at its minimum are used, and it is the external aqueous phase W2 about interior or primary emulsion W1 / O. It is prepared by adding

[0065] In case primary emulsion W1 / O is formed, it is 0.1 – 99% of the weight of the aqueous phase W1. It is desirable to use it. This amount is the aqueous phase W1. The weight of the water-soluble active ingredient of arbitration like the vitamin in which it is held in inside and deals is included. The oil phase O of primary emulsion W1 / O is used in 1 – 99.9% of the weight of an amount. This amount contains the weight of the elastomer silicone polyether contained in an oil phase O, other oils of arbitration, an oil solubility vitamin, or a lipophilicity active ingredient.

[0066] Next, 0.1 – 70% of the weight of primary emulsion W1 / O, and 30 – 99.9% of the weight of the final water continuous phase W2 They are multiplex emulsion W1 / O/W2 by only mixing. It can prepare. Continuous phase W2 An amount contains the mass of the water-soluble materials of an addition of the arbitration contained in the final continuous phase.

[0067]

[Example] In order to explain this invention in more detail, an example is shown below. In the example of the hand containing example 1-vitamin C, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. one side of these emulsions — O' / W2 \*\*\*\*\* — what is expressed — it is — another emulsion — W1 / O/W2 of this invention It was what is expressed as a multiplex emulsion.

[0068] Stearin acid (product marketed by the trade name of HYSTRENEFG of Witco Corporation.

New York, and New York) of 10g of preparation of PERT A. one oil phase (O') 10g glycerol monostearate and polyoxyethylene stearate (nonionic surface active agent currently sold by ICI Surfactants, Wilmington, and Delaware by the trade name ARLACEL 165), And 25g petrolatum (it is the semisolid petroleum jelly currently used as an emollient) Witco Corporation, New York, and New York It measured with what is marketed by the trade name WHITE PROTOPET, and put into the glass beaker. The purpose of the stearin acid in this example is O' / W2. Nonionic surface active agent ARLACEL 165 for making the petroleum jelly in an emulsion emulsify In addition, it is making stearin acid act as an anionic surface active agent. Since these components were solid-states, in order to carry out melting, they put these components into the 80-degree C hot water bath. a 0.5g bridge formation polyacrylic acid polymer (what is the thickener generally known for other situations as carbomer (carbomer), and is marketed by B.F.Goodrich Company, Brecksville, and Ohio by the trade name CARBOPOL EDT 2001) — melting — the inside of the body was distributed.

[0069] The triethanolamine of 5.0g of preparation of PERT B. one aqueous phase (W2) was added to 50g deionized water [ 70-degree C ]. Lightning The solution was mixed by 200rpm (21 rad/s) using the mixer for laboratories of a brand. The purpose of the triethanolamine in this example is making it act generally as a matter of fact as a neutralizer to the carbomer thickener which is acidity a little.

[0070] The preparation (EO) 12 of a PERT C. primary emulsion (W1 / O) and the crosslinking bond in decamethyl cyclopentasiloxane (D5) measured 20g of solutions which contain the elastomer silicone polyether which exists by the ratio of 1:5 9% of the weight, put into the glass beaker, and were mixed by 800rpm (84 rad/s) using the mechanical mixer. In addition, 156g (W1) of solutions which contain the vitamin C (product of Fluka Chemie AG, Buchs, and Switzerland) distributed by water 10% of the weight was mixed over 20 minutes. It is related with an elastomer silicone polyether forming primary emulsion W1 / O in this example, and is D5. It acted as an emulsifier to receive. The phase O in primary emulsion W1 / O is D5. It is constituted by the combination of an elastomer silicone polyether. The vitamin C which is water solubility is the phase W1 of primary emulsion W1 / O. A part is constituted.

[0071] It is emulsion O' / W2 by filling PERT B with PERT A and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s). It prepared. It cooled radiationally at 55 degrees C, having taken out the sample from the water bath and mixing by 200rpm (21 rad/s). Next, PERT C was added. The rate of a mixer is made to increase to 500rpm (52 rad/s) gradually, and it was made to mix appropriately. When continuing mixing and becoming 50 degrees C, making 50 degrees C cool a sample, the deionized water of the addition to have been lost for evaporation was added, and it mixed with 1.5g 1 and 3-dimethylol -5, and 5-dimethyl (DMDM) hydantoin (Lonza Incorporated, antiseptics for emulsions marketed by Fair Lawn New Jersey by the trade name GLYDANT (trademark)) for 5 minutes.

[0072] The obtained ingredient was the white lotion of the shape of a stable emulsion. When the optical microscope investigated this product, they are multiplex emulsion W1 / O/W2 in a product. Existence was checked.

[0073] In the example of an example of comparison 1-hand, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. one side of these emulsions — O' / W2 \*\*\*\*\* — what is expressed — it is — another emulsion — O/W2 It was what is expressed as an emulsion.

The preparation (EO) 12 of a PERT C. primary emulsion (W1 / O) and the crosslinking bond in decamethyl cyclopentasiloxane (D5) measured 20g of solutions which contain the elastomer silicone polyether which exists by the ratio of 1:5 9% of the weight, put into the glass beaker, and were mixed by 800rpm (84 rad/s) using the mechanical mixer. In addition, 156g (W1) of solutions which contain the vitamin C (product of Fluka Chemie AG, Buchs, and Switzerland) distributed by water 10% of the weight was mixed over 20 minutes. It is related with an elastomer silicone polyether forming primary emulsion W1 / O in this example, and is D5. It acted as an emulsifier to receive. The phase O in primary emulsion W1 / O is D5. It is constituted by the combination of an elastomer silicone polyether. The vitamin C which is water solubility is the phase W1 of primary emulsion W1 / O. A part is constituted.

[0074] It is emulsion O' / W2 by filling PERT B with PERT A and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s). It prepared. It cooled radiationally at 55 degrees C, having taken out the sample from the water bath and mixing by 200rpm (21 rad/s). Next, PERT C was added. The rate of a mixer is made to increase to 500rpm (52 rad/s) gradually, and it was made to mix appropriately. When continuing mixing and becoming 50 degrees C, making 50 degrees C cool a sample, the deionized water of the addition to have been lost for evaporation was added, and it mixed with 1.5g 1 and 3-dimethylol -5, and 5-dimethyl (DMDM) hydantoin (Lonza Incorporated, antiseptics for emulsions marketed by Fair Lawn New Jersey by the trade name GLYDANT (trademark)) for 5 minutes.

[0075] The obtained ingredient was the white lotion of the shape of a stable emulsion. When the optical microscope investigated this product, they are multiplex emulsion W1 / O/W2 in a product. Existence was checked.

[0076] In the example of an example of comparison 1-hand, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. one side of these emulsions — O' / W2 \*\*\*\*\* — what is expressed — it is — another emulsion — O/W2 It was what is expressed as an emulsion.

[0077] About stearin acid (HYSTRENE FG) of 10g of preparation of PERT A. one oil phase (O'), it is 10g nonionic surface active agent ARLACEL 165. And with 25g petrolatum petroleum jelly, it measured and put into the glass beaker. In order to carry out melting, these components were put into the 80-degree C hot water bath. next, the 0.5g carbomer — melting — the inside of the body was distributed.

[0078] The triethanolamine of 5.0g of preparation of PERT B. one aqueous phase (W2) was added to 50g deionized water [ 70-degree C ]. Lightning The solution was mixed by 200rpm (21 rad/s) using the mixer for laboratories of a brand.

[0079] PERT — C . — another side — an oil phase — (— O —) — preparation — (— EO —) — 12 — decamethyl — cyclopentasiloxane (D5) — inside — a crosslinking bond — 1:5 — a ratio — existing — an elastomer — silicone — a polyether — nine — % of the weight — containing — a solution — 25 — g — measuring — a glass beaker — having put in . The primary emulsion was not prepared in this example.

[0080] It is emulsion O' / W2 by filling PERT B with PERT A and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s). It prepared. It cooled radiationally at 55 degrees C, having taken out the sample from the water bath and mixing by 200rpm (21 rad/s). Next, PERT C was added. The rate of a mixer is made to increase to 500rpm (52 rad/s) gradually, and it was made to mix appropriately. When continuing mixing and becoming 50 degrees C, making 50 degrees C cool a sample, the deionized water of the addition to have been lost for evaporation was added, and it mixed with 1.5g DMDM hydantoin (Lonza Incorporated, antiseptics for emulsions marketed by Fair Lawn New Jersey by the trade name GLYDANT (trademark)) for 5 minutes.

[0081] The obtained ingredient was the white lotion of the shape of a stable emulsion. When the optical microscope investigated this product, existence of a multiplex emulsion was not checked in the product. This example of a comparison shows the effectiveness about not forming a primary emulsion.

[0082] In the example of the hand containing example of comparison 2 vitamin A, and E, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. One side of these emulsions is expressed as O' / W2, and another emulsion was what is expressed as the O/W2' emulsion of this invention.

[0083] About stearin acid (HYSTRENE FG) of 10g of preparation of PERT A. one oil phase (O'), it is 10g nonionic surface active agent ARLACEL 165. And with 25g petrolatum petroleum jelly, it measured and put into the glass beaker. In order to carry out melting, these components were put into the 80-degree C hot water bath.

[0084] 50g of 1-% of the weight aquosity dispersing elements of the preparation carbomer thickener of PERT B. one aqueous phase (W2) was measured, and it put into another beaker with 308.5g hot deionized water. This dispersing element was put into the hot water bath, and it mixed by 200rpm (21 rad/s) using the mechanical mixer.

[0085] The triethanolamine of 5.0g of preparation of PERT C. another aqueous phase (W2') was

added to the glass beaker with 50g hot deionized water. The solution was manually mixed using the glass stirring rod until the solution became homogeneity.

[0086] PERT — D . — another side — an oil phase — (— O —) — preparation — (— EO —) — 12 — decamethyl — cyclopentasiloxane (D5) — inside — a crosslinking bond — 1:5 — a ratio — existing — an elastomer — silicone — a polyether — nine — % of the weight — containing — a solution — 50 — g — measuring — a glass beaker — putting in — a mechanical mixer — using it — 600rpm (63 rad/s) — having mixed . 9.68g of mixture which consists of the vitamin A acetate (product of Fluka ChemieAG, Buchs, and Switzerland) and COVI-OX T -50 (Henkel Corporation, La Grange, vitamin-E product of Illinois) of equal number of copies and by which preliminary preparation was carried out was added to the elastomer silicone polyether over 10 minutes. Said vitamins constituted 16.2% of the weight of the total weight of this (O) phase. The primary emulsion was not prepared in this example.

[0087] It is emulsion O' / W2 by filling PERT B with PERT A, and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s), if melting of PERT A is carried out to homogeneity. It prepared. Next, PERT C (W2') neutralized emulsion O' / W2, and it mixed for 5 more minutes. The rate of a mixer is made to increase to 350rpm (from 21 rad/s to 37 rad/s) gradually from 200rpm, and it was made to mix appropriately during neutralization. It cooled radiationally at 55 degrees C, having taken out the sample from the hot water bath, and mixing by 350rpm (37 rad/s). When the temperature of a sample amounted to 55 degrees C, 25g PERT D was added. Mixing was continued and the sample was cooled radiationally at 50 degrees C. The deionized water of the addition to have been lost for 1.5g DMDM hydantoin and evaporation was added to the sample after cooling, and it mixed for 5 minutes.

[0088] The obtained ingredient was the smooth light yellow lotion of the shape of a stable emulsion. When the optical microscope investigated this product, existence of a multiplex emulsion was not checked in the product. The effectiveness about this example of a comparison not forming a primary emulsion, either is shown.

[0089] In the example of the hand containing example 3-vitamin A and E, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. One side of these emulsions was what is expressed as W which is expressed as /W2 and another emulsion requires for this invention1 / O'O/W2' multiplex emulsion. In contrast with the previous example of a comparison, the primary emulsion was formed in this example.

[0090] About stearin acid (HYSTRENE FG) of 10g of preparation of PERT A. one oil phase (O'), it is 10g nonionic surface active agent ARLACEL 165. And with 25g petrolatum petroleum jelly, it measured and put into the glass beaker. In order to carry out melting, these components were put into the 80-degree C hot water bath.

[0091] 50g of 1-% of the weight aquosity dispersing elements of the preparation carbomer thickener of PERT B. one aqueous phase (W2) was measured, and it put into another beaker with 308.5g hot deionized water. This dispersing element was put into the hot water bath, and it mixed by 200rpm (21 rad/s) using the mechanical mixer.

[0092] The triethanolamine of 5.0g of preparation of PERT C. another aqueous phase (W2') was added to the glass beaker with 50g hot deionized water. The solution was mixed with the glass stirring rod until the solution became homogeneity.

[0093] The preparation (EO) 12 of PERT D. primary emulsion W1 / O and the crosslinking bond in decamethyl cyclopentasiloxane (D5) measured 20g of solutions which contain the elastomer silicone polyether which exists by the ratio of 1:5 9% of the weight, put into the glass beaker, and were mixed by 600rpm (63 rad/s) using the mechanical mixer. 3.87g of mixture which consists of the vitamin A acetate (product of Fluka ChemieAG, Buchs, and Switzerland) and COVI-OX T-50 (Henkel Corporation, La Grange, vitamin-E product of Illinois) of equal number of copies and by which preliminary preparation was carried out was added to the elastomer silicone polyether over 10 minutes. These components constituted the oil phase (O). Next, 23.87g (W1) of water solutions which contain the lactic acid which is a wetting agent in this mixture that consists of these components 10% of the weight was added. These components were mechanically mixed for 15 minutes. As indicated for Example 1, the elastomer silicone polyether acted as an emulsifier to D5 about forming primary emulsion W1 / O. The phase O in primary emulsion W1 / O is said

vitamins and D5. It is constituted by the combination of an elastomer silicone polyether.

[0094] It is emulsion O' / W2 by filling PERT B with PERT A, and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s), if melting of PERT A is carried out to homogeneity. It prepared. Next, PERT C (W2') neutralized emulsion O' / W2, and it mixed for 5 more minutes. The rate of a mixer is made to increase to 350rpm (from 21 rad/s to 37 rad/s) gradually from 200rpm, and it was made to mix appropriately during neutralization. It cooled radiationally at 55 degrees C, having taken out the sample from the hot water bath, and mixing by 350rpm (37 rad/s). When the temperature of a sample amounted to 55 degrees C, 25g PERT D was added. Mixing was continued and the sample was cooled radiationally at 50 degrees C. The deionized water of the addition to have been lost for 1.5g DMDM hydantoin and evaporation was added to the sample after cooling, and it mixed for 5 minutes.

[0095] The obtained ingredient was the smooth light yellow lotion of the shape of a stable emulsion. When the optical microscope investigated this product, existence of multiplex emulsion W1 / O/W2' and coexistence were checked in the product. This example shows the importance of forming a primary emulsion.

[0096] Although the elastomer silicone polyether prepared according to U.S. Pat. No. 5,811,487 uses it according to this invention and it is the most desirable, the elastomer silicone polyether of other molds can be used in this invention, without separating from the range of this invention.

[0097] For example, one mold of the elastomer silicone polyether which can be used Organic silicon monomer:ZMe<sub>2</sub> SiO(Me<sub>2</sub> SiO) *r* s SiMe(MeHSiO)<sub>2</sub> Z and QMe<sub>2</sub> SiO(Me<sub>2</sub> SiO) *t* u SiMe(MeQSiO)<sub>2</sub> Q (Me is the methyl among a formula) of a mono-alkenyl polyether and the following two molds Z is CH<sub>3</sub> or H a condition [ two H atoms existing, even if few per molecule ]. Q is vinyl, other alpha-partial saturation alkenyl radicals, or CH<sub>3</sub> a condition [ two carbon-carbon double bonds existing, even if few per molecule ]. *r* — 0-1,000 — it is — *s* — 0-100 — it is — *t* — 0-1,000 — it is — *u* — 0-100 — it is — it is prepared by making it react.

[0098] As an elastomer silicone polyether of other molds which can be used, it is organic silicon monomer:  $(RMe_2 SiO \frac{1}{2})_v w (SiO \frac{4}{2})_x (RSiO \frac{3}{2})_y$  of a mono-alkenyl polyether and other following two molds  $(RMeSiO \frac{2}{2})$ . And [0099]

[Formula 6]

$$Q\text{Me}_2\text{SiO}(\text{Me}_2\text{SiO})_2(\text{Me}_2\text{SiO})_4\text{SiMe}_2\text{Q}$$

[0100] (Among a formula, Me is methyl and R is methyl or H a condition [ two H atoms existing, even if few per molecule ].) Q is vinyl, other alpha-partial saturation alkenyl radicals, or methyl a condition [ two carbon-carbon double bonds existing, even if few per molecule ]. v — 2-50 — it is — w — 0-20 — it is — x — 0-50 — it is — y — 0-1,000 — it is — z — 0-1,000 — it is — lambda — 0-100 — it is — it is the thing of the mold prepared by making it react.

[0101] In the following example 4, how to prepare the elastomer silicone polyether of the mold of this latter is shown.

Example 4 — this example — setting — ESCO EL-1 The processor mixer was used. This processor mixer was equipped with the circulation bath which has the glassware with a 1l. jacket which has heating and cooling power, the support sweep blade whose rate accommodation set point is 20 – 300rpm (2 – 31 rad/s), the high-speed homogenizer which has a rate adjustment for operation of a Cowles mold blade and 750 – 15,000rpm (78 – 1,570 rad/s), a thermometer, product sending opening, a vacuum connector, and heating and cooling power. The raw material and amount which were used in order to prepare an elastomer silicone polyether formula: — Si [OSi(CH<sub>3</sub>)<sub>2</sub> H]<sub>4</sub> 9.75 % of the weight; CH<sub>2</sub> of 0.09 % of the weight [ of tetrakis (dimethyl siloxy) silanes ]; vinyl end poly dimethylsiloxane which has about 300 dimethyl siloxy units in molecule =CH(CH<sub>2</sub>) f O expressed () [ CH<sub>2</sub> ] 0.16 % of the weight of mono-alkenyl polyethers of a CH<sub>2</sub> O g hT (CH<sub>2</sub> CH<sub>3</sub> CHO) (inside of formula and T are H) mold; Decamethyl cyclopentasiloxane 90 % of the weight; and a callus TETTO catalyst, That is, it was 0.19 % of the weight of platinum divinyl tetramethyl disiloxane complexes containing 1% of the weight of platinum. The 1st process in manufacture of an elastomer silicone polyether was adding a tetrakis (dimethyl siloxy) silane, a mono-alkenyl polyether, and 80% of the weight of decamethyl cyclopentasiloxane to an ESCO mixer. The mixer was sealed after loading an ESCO mixer with an ingredient. Heating of a mixer

was started by setting a circulation bath as the set point of 50 degrees C. While operating the sweep blade of a mixer to 20% of the capacity, the homogenizer of a mixer was operated to 5% of the capacity. The platinum catalyst was added to the ESCO mixer by the syringe through the porthole of an ESCO mixer, and the timer was started. Mixing was continued for 1 hour. Vinyl end poly dimethylsiloxane was measured and it put into the beaker. The vinyl end poly dimethylsiloxane was added to the ESCO mixer by removing a sending opening plug. The remaining decamethyl cyclopentasiloxane was added to the ESCO mixer following this addition. Sending opening was closed and the timer was made to restart. The rate of a homogenizer was made to increase to 10% of the capacity. It is thickened and begun to gel the fluid in a mixer, and it began to follow in footsteps of the shaft of a mixer. While making the rate of a homogenizer increase to 20 – 25% of the capacity, the scraper in a mixer was set to 20 – 25% of the capacity, and mixing was continued. All the mixing time measured from the addition point in time of vinyl end poly dimethylsiloxane was 2.5 – 3 hours at 50 degrees C. After this time amount passed, the laying temperature of a mixer was lowered to 25 degrees C, and mixing was continued until the product was cooled by 30 degrees C. Next, the mixer was suspended and the sample in a mixer was taken out. It illustrates the multiplex emulsion which starts this invention using the elastomer silicone polyether of the mold prepared in this example being nice, and preparing the further following example.

[0102] In the example of the hand containing example 5-vitamin A and E, and body lotion \*\*, two sorts of emulsions which live together were prepared as an ingredient of an end product. One side of these emulsions was what is expressed as Wwhich is expressed as /W2 and another emulsion requires for this invention1 / O'O/W2' multiplex emulsion. Again, the primary emulsion was formed in this example.

[0103] About stearin acid (HYSTRENE FG) of 10g of preparation of PERT A. one oil phase (O'), it is 10g nonionic surface active agent ARLACEL 165. And with 25g petrolatum petroleum jelly, it measured and put into the glass beaker. In order to carry out melting, these components were put into the 80-degree C hot water bath.

[0104] 50g of 1-% of the weight aquosity dispersing elements of the preparation carbomer thickener of PERT B. one aqueous phase (W2) was measured, and it put into another beaker with 308.5g hot deionized water. This dispersing element was put into the hot water bath, and it mixed by 200rpm (21 rad/s) using the mechanical mixer.

[0105] The triethanolamine of 5.0g of preparation of PERT C. another aqueous phase (W2') was added to the glass beaker with 50g hot deionized water. The solution was mixed with the glass stirring rod until the solution became homogeneity.

[0106] 70g of solutions which contain the elastomer silicone polyether prepared in the example 4 of preparation of PERT D. primary emulsion W1 / O in decamethyl cyclopentasiloxane (D5) was measured, and it put into the glass beaker, and mixed by 600rpm (63 rad/s) using the mechanical mixer. In addition, 30g (W1) of water solutions which contain vitamin C (product of Fluka Chemie AG, Buchs, and Switzerland) 10% of the weight was mixed with other two components over 10 minutes. An elastomer silicone polyether and decamethyl cyclopentasiloxane constituted the oil phase (O). This elastomer silicone polyether is also related with making primary emulsion W1 / O form, and it is D5. It received and acted as an emulsifier. Phase W1 in primary emulsion W1 / O It was constituted by the water solution which contains vitamin C as an active ingredient.

[0107] It is emulsion O' / W2 by filling PERT B with PERT A, and mixing PERT A and PERT B for 5 minutes by 200rpm (21 rad/s), if melting of PERT A is carried out to homogeneity. It prepared. Next, PERT C (W2') neutralized emulsion O' / W2, and it mixed for 5 more minutes. The rate of a mixer is made to increase to 350rpm (from 21 rad/s to 37 rad/s) gradually from 200rpm, and it was made to mix appropriately during neutralization. It cooled radiationally at 55 degrees C, having taken out the sample from the hot water bath, and mixing by 350rpm (37 rad/s). When the temperature of a sample amounted to 55 degrees C, 25g PERT D was added. Mixing was continued and the sample was cooled radiationally at 50 degrees C. The deionized water of the addition to have been lost for 1.5g DMDM hydantoin and evaporation was added to the sample after cooling, and it mixed for 5 minutes.

[0108] The obtained ingredient was the smooth white lotion of the shape of a stable emulsion.

When the optical microscope investigated this product, existence of multiplex emulsion W1-O/W2' and coexistence were checked in the product. This example checks the importance of forming a primary emulsion.

[0109] The constituent concerning this invention has special value in the personal care field. Even if the constituent concerning this invention is used by these very thing, or in order to form the various personal care products of a medical practitioner's formula needlessness (OTC), it may be blended with other compounds for cosmetics.

[0110] For example, the component of this invention is useful as a carrier in a sweating inhibitor and a deodorant. The constituent of this invention is smooth and can improve the property of the soapsuds for a FESHARU treatment like skin cream, a skin care lotion, a humidification agent, an acne remover, or a wrinkling picking agent, personal cleanser and FESHARU cleanser, bus oil, a perfume, a colon, SASSHIE (sachets), a sunscreen agent, a pre-shave lotion and an aftershave lotion, liquid soap, the soap for razors, and razors. In order to raise gloss, and in order to offer the advantage which carries out conditioning, the constituent of this invention can be used all over a hair shampoo, hair conditioner, hair spray, a mousse, a permanent, a depilatory, and a cuticle coat.

[0111] In cosmetics, the constituent of this invention acts as a makeup, colored cosmetics (color cosmetics), foundation, BURASSHIE (blushes), a lipstick (lip sticks), a lip balm agent (lip balms), an eyeliner, mascara, an oil remover, a colored cosmetics remover, the \*\* exhibition agent for the pigments in powder, and a spreader. When the constituent of this invention is included in a stick (sticks), gel, a lotion, aerosol, and rollon (roll-ons), the constituent of this invention gives smoothness like the silk been smooth.

[0112] Furthermore, the constituent of this invention shows other advantages and useful properties like storage stability and the ease of carrying out of preparation. So, the application of the constituent of this invention is large and it is useful, especially concerning carrying out conditioning of the inside of a sweating inhibitor, a deodorant, and a skin care product, and the hair especially.

[0113] Furthermore, the constituent of this invention can act as an activity carrier for matter biologically [ drugs, a biocide, a herbicide, agricultural chemicals, and others ], and can use the constituent of this invention for introducing water and the water-soluble matter into a hydrophobic system.

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[Translation done.]